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Inflation Adjustments of Financial Statements

Application of International Accounting Standard 29

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A framework for applying International Accounting Standard 29 to adjust the financial statements of revenue-earning enterprises operating in inflationary economies.

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This paper — a product of the Agricultural Policies Division, Agriculture and Rural Development Department — is part of a larger effort in PRE to provide guidance on the design of financial institutions and on their management practices. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Cicely Spooner, room N8-035, extension 30464 (54 pages).

The Bank's draft Operational Directive on Financial Sector Operations requires the adjustment of financial statements in countries where the cumulative inflation rate over three years approaches or exceeds 100 percent. Financial statements in those countries are to follow the accounting principles in International Accounting Standard 29 (IAS 29) of the International Accounting Standards Committee.

IAS 29 provides a list of principles and requirements but does not outline the procedure for measuring income. Nor does it provide a numerical example.

This paper provides a framework for applying IAS 29 to adjust financial statements accompanied by numerical examples and thus may be considered as an extension of the standard.

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INFLATION ADJUSTMENTS OF FINANCIAL STATEMENTS

(Application of International Accounting Standard 29:

Financial Reporting in Hyperinflationary Economies)

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FOREWORD

Financial statements without adequate adjustment to inflation do not reflect appropriately the financial position and performance of business enterprises. Furthermore, unadjusted financial statements can be meaningless or even misleading under inflationary conditions. Several countries have implemented different adjustment procedures resulting in lack of uniformity. A uniform solution to the problem of assessing financial performance of enterprises in an inflationary environment has been long overdue.

Recent developments, however, have resolved much of the above problems. These developments are:

- a) A new International Accounting Standard (IAS 29) was issued in July 1989, setting up the framework for meaningful and uniform financial reporting in inflationary economies. This International Standard specifies the adjustment requirements and has become operative for financial statements covering periods beginning on or after January 1, 1990.
- b) The Bank draft Operational Directive (OD) on financial sector operations requires Bank borrowers in countries where the cumulative inflation rate over three years is approaching or exceeds 100% to adjust their financial statements in accordance with IAS 29.¹

¹ The Bank OD requires that financial statements be based on the inflation accounting principles laid down in International Accounting Standard 29 (Annex A, para 4(d)). Furthermore, the OD calls for financial and loan collection performance that "...taking inflation into account, avoids the erosion of its capital" (OD, page 17 para 65 (c)). In our opinion, the measurement of capital preservation can be achieved, under inflationary conditions, only through carrying out the adjustment of financial statements to inflation.

It is worth mentioning that the standard Bank loan agreement with a borrower other than member country requires that; "the borrower shall maintain records and accounts adequate to reflect, in accordance with sound accounting practice, its operations and financial condition"². With the issuance of IAS 29 therefore, compliance with this standard by Bank borrowers which are revenue earning entities, should be required pursuant to the borrower's basic obligation to maintain "sound accounting practice".

The aims of this paper are (i) to inform Bank staff, borrowers, their CEO's, chief accountants, those who are directly responsible for financial reporting and their independent external auditors on the need to comply with the financial reporting requirements set by IAS 29, for all financial statements scheduled to be submitted to the Bank, covering periods beginning on or after January 1, 1990; and (ii) to provide explanations on the framework, and to suggest procedures to carry out the adjustment.

IAS 29 provides a list of principles and requirements. It does not, however, delineate the procedures for measuring the adjusted income nor does it provide numerical illustrations. The present paper may be considered as an extension of the Standard as it provides a framework for applying IAS 29 for adjusting financial statements, accompanied by numerical examples.

² Article V section 5.01 of the typical loan agreement with such entities. Also, the standard Bank loan agreement entitles the Bank to requires the borrower to furnish to the Bank reports of audits of its financial statements carried out in accordance with appropriate auditing principles consistently applied of such scope and in such detail as the Bank shall have reasonably requested..." Ibid., Article V, Section 5.01 (b).

The application of IAS 29 to a financial institution is simpler than that of an industrial or an agricultural enterprise. This is because the former does not carry material inventories of goods which should be restated during inflation and the share of depreciation in total expenses is relatively low. Therefore, the paper illustrates a full application of IAS 29 to an agro-industrial enterprise.

It is beyond the scope of this paper (i) to estimate the resources, both human and financial that would be required to accomplish the task of adjusting financial statements and (ii) to delineate short-cut procedures which can ease the task of applying IAS 29, especially when carried out by an outside analyst.

However, it is safe to claim that the resources needed for accomplishing the required adjustment are significant, and that without Bank initiative, at this stage, many borrowers would be either uninformed of or incapable of complying with the adjustment requirements laid out in the IAS 29.

1. Introduction

The International Accounting Standards Committee issued in July 1989, the International Accounting Standard (IAS 29) - "Financial Reporting in Hyperinflationary Economies", which became operative for financial statements covering periods beginning on or after January 1, 1990. "This statement applies to the ... financial statements ... of any enterprise that reports in the currency of a hyperinflationary economy" (par. 1). Hyperinflation is indicated by several characteristics of the economic environment of a country, ... [mainly where] the cumulative inflation rate over three years is approaching, or exceeds, 100% - that is, 26% per annum (par. 3).¹ Several countries have already adopted requirements that conform with IAS 29.² This standard will certainly improve "the quality of presentation of financial statements" and "increase the degree of uniformity", as stated in the Preface to IAS.

1.1 Distortionary Effects of Inflation

Conventional financial statements of a company are based on the assumption that the monetary unit is stable. Under inflationary conditions, however, the purchasing power of the money declines, causing some crucial figures of the conventional financial statements, especially net income and nonmonetary assets' value to be distorted. Thus, "a hundred feet plus ten centimeters is certainly not a hundred and ten anything, and the accountant's balance-sheet total is not much better". (Boulding, p. 54).³

In other words, during a period of inflation, the values of assets and some cost items (such as depreciation of fixed assets), as recorded in the financial statements, tend to be understated. To provide meaningful

information, these figures should be revalued. Revaluation can be carried out in several ways, mainly by adjusting the acquisition cost of each unit of fixed asset or batch of raw material by the appropriate price index or market price. These ways are, however, tedious and costly. Short-cut procedures can provide approximate revalued figures, thereby overcoming the main distortions which are eminent in conventional financial statements of companies reporting in an inflationary economy.

1.2 Inflation Adjustment According to IAS 29

Inflation adjustment is carried out, according to IAS 29, by restating some relevant figures using the general price index that reflects changes in the general purchasing power. The adjustment does not deal with 1) changes in relative value of assets and goods as measured by specific price indexes, or 2) the replacement value of assets and goods, as some standards dealing with inflation-adjustments or financial statement.⁴ However, to follow the accounting principle of "the lower of cost or market value", market values should be obtained. In summary, IAS 29 requirements are an extension of the historical-cost accounting methods, where adjustments are made for changes in the general purchasing power of the money as measured by the consumer price index.

1.3 Advantages of IAS 29

IAS 29 provides relatively few requirements for adjusting financial statements of a company reporting in a "hyperinflation economy". The figures in the resulting adjusted statements should convey the same meaning as those derived from conventional financial statements when stable prices prevail.

IAS 29 has an important advantage over other standards dealing with inflation-adjustments of financial statements: It places high importance on arriving at usable information rather than stressing detailed recording and computational procedures, as can be learned from the following.

"The restatement of financial statements in accordance with this Statement requires the application of certain procedures as well as judgement. The consistent application of these procedures and judgments from period to period is more important than the precise accuracy of the resulting amounts included in the restated financial statements." (IAS 29, par, 8; emphasis added).

Furthermore, IAS 29 suggests use of an independent professional assessment in cases where detailed records of acquisition dates are not available (par. 14).

As such, IAS 29 should be classified within Dewhirst's two higher level accounting theory models, as described in a recent paper in the International Journal of Accounting.⁵ These two higher level models are:

- 1) The Substance Oriented Model, which "emphasizes both the balance sheet and income statement to represent the economic situation of the accounting entity", and
- 2) The Needs Oriented Model, which emphasizes "user decision-making information satisfaction", (p. 107), rather than a Procedure Oriented Model, which accounts for processing transactions under generally accepted accounting principles.

1.4 Objectives of the Paper

The paper follows the spirit of IAS 29 in emphasizing the usefulness of the inflation-adjusted financial data, by applying procedures and judgment consistently rather than stressing precision and accuracy. (IAS 29, par. 8).

The objective of this paper is to outline the procedures to be used in applying IAS 29 to restate a company's conventional financial statements and to illustrate these procedures. The main procedures are related to the restatement of balance sheet items.

There are two approaches for restating balance-sheet items:

- 1) A comprehensive procedure where each transaction related to both balance-sheet and income-statement items is restated. This procedure suits the case where all the data required for restating purposes are available and reliable.
- 2) Simple procedures where only key balance-sheet items are restated. These procedures suit the case where either the required data are not available or where full in-depth analysis is not called for. The latter is especially suitable for adjusting published financial statements by an outside analyst as explained in Section 1.7.

This paper provides the framework for applying both approaches for restating the financial statements. It also presents some procedures accompanied by numerical illustrations that can be classified within the second approach. However, presenting short-cut procedures that will enable an outside analyst to carry out a complete adjustment of a company's financial statements is beyond the scope of this paper.

A major effect of inflation on the financial statements is through the unique behavior of the interest expense. Therefore, this subject is presented as an extended introduction (Chapter 2).

1.5 The Role of Balance Sheet in Income Measurement

Inflation-adjusted net income of a company in a period is best determined by the change in its equity (excluding new issues and distributions), measured in constant prices, between the closing and opening balance sheets.⁶ The value of equity is equal to the value of assets at current prices less liabilities, stated at the price level of the balance sheet date. The net income after tax and after dividends is retained (that is, added to the reserve or equity account with the balance sheet); thus, it is stated in terms of the price level at the closing balance sheet date. Under IAS 29, the inflation-adjusted (current-cost) net income is determined by adding to or subtracting from the historical-cost net income some inflation adjustments of costs and values that are related to balance sheet items. IAS 29 also requires restating the income-statement items.

1.6 Classification of Balance Sheet Items

Balance sheet items are classified into two distinct types -- monetary and nonmonetary items.

Monetary Items - Monetary items are assets and liabilities, the nominal value of which is stated in monetary units which represents the real value of the item concerned regardless of changes in the general price level, such as cash, accounts and notes receivable or payable in domestic currency, and loans in domestic currency that are not linked to a price index or pegged to another currency. These items are expressed in current prices. Loans linked to a price

index or pegged to another currency are recorded in the conventional financial statement at restated value; thus, these loans are already recorded in current prices. Holding monetary assets, the return of which is not inflation-compensated (e.g. cash), results, under inflationary conditions, in loss of purchasing power.

Nonmonetary Assets - Nonmonetary assets are assets the nominal value of which changes with the general price level, such as fixed assets, shares and inventories. These assets must be restated in current cost; that is, the assets will continue to be recorded at cost, but cost in terms of current purchasing power at the date of the balance sheet.

In summary, monetary items (cash, receivables, payables, loans) should not be restated; nonmonetary assets (inventories, shares, fixed assets), on the other hand, must be restated.

1.7 Inflation-Adjustment by An Outside Analyst

The main work involved in inflation-adjustment of financial statements is the restatement of nonmonetary assets. For this purpose, detailed data on the acquisition costs and rates of a large amount of items are required. In some cases, these data are not available, especially to an outside analyst. In other cases, these data are not reliable or the costs of collecting and processing these voluminous data become prohibitive.

To overcome these limitations, simplified and approximating procedures can serve as a second best method. These procedures are applied to the stock of each category of nonmonetary assets. Thus, restatement can be carried out by

applying the approximating procedures to only those items for which detailed or reliable data are not available.

1.8 Working Steps

There are seven steps in inflation-adjustment of a company's financial statements. The first four steps provide restated balance sheets and adjusted net income for a given year. The next two steps provide an adjusted income statement and the last step provides meaningful financial figures for time-series analysis.

1. Restating the opening balance sheet for the year under analysis.
This is the main time-consuming step, especially regarding the fixed assets.
2. Restating intra-year capital transactions.
3. Restating the closing balance sheet, to arrive at current values.
4. Deriving the year's adjusted net income.
5. Restating depreciation and stocks of inventories to arrive at the adjusted income statement.
6. Restating all income-statement items (that is, outputs and inputs) to arrive at year-end values.
7. Updating time-series restated financial figures to the last year's prices, to enable inter-year comparisons of financial information.
The application of these steps to a simplified set of financial statements is presented in Chapter 3.

2. THE UNIQUE BEHAVIOR OF INTEREST EXPENSE DURING INFLATION

Inflation has essentially two major effects on the figures reported in the financial statements of a company:

1. The recorded acquisition (historical) costs of nonmonetary assets are understated in terms of current prices (assets value, materials from inventory and depreciation expenses).
2. The interest expenses include inflation-compensation of the principal; that is, a fraction of the recorded nominal interest expense, is, in an economic sense, a balance-sheet item rather than an income-statement item.

This unique behavior of interest expense during inflation causes conceptual complications in adjusting conventional financial statements, as explained in this chapter. This aspect has also serious effects on the financial liquidity of the firm, a subject not presented here because it is out of the scope of this paper.

2.1 Determining the Nominal Interest Rate

Inflation affects nominal market rates of interest. Assuming that the long-run, pre-inflation interest rate remains unchanged during inflation, then, during inflation, the nominal interest rate when inflation is fully anticipated, includes both the pre-inflation, real interest rate and the inflation rate. Accordingly, the nominal interest rate is determined as follows

$$r = (1 + r^*)(1 + p) - 1 = p + r^* (1 + p)$$

where r = required nominal interest rate = inflation-compensated rate,

r^* = long-run, pre-inflation interest rate,

p = inflation rate, expected.

Suppose the pre-inflation interest rate is 5% and the expected inflation rate is 20%, then the nominal interest rate should be

$$r = (1 + 0.05)(1 + 0.20) - 1 = 0.20 + 0.05(1 + 0.20) = 0.26 = 26\%$$

2.2 Effect of Inflation on Loan Repayment

Loan service is composed of interest on the opening principal and repayment of some portion of the principal. The interest is recorded as expense in the income statement whereas the principal repayment reduces the loan value recorded in the balance sheet. During inflation, however, this behavior is changed.

In order to simplify the analysis of the effect of inflation on loan service and on the interest expenses, let us assume that the actual inflation rate equals the expected rate used in determining the nominal interest rate. (This assumption is discarded later in Section 2.6). Then, the interest expense on a loan, L , is

$$rL = pL + r^*[(1 + p)L]$$

where L = loan's principal at beginning of year.

Given the former example, the interest expense on a \$100 loan is

$$rL = 0.20 \cdot 100 + 0.05[(1 + 0.20) \cdot 100] = 20 + 6 = \$26$$

The interest expense is composed of:

- 1) Inflation-compensation on the principal,
20% on \$100 = \$20
- 2) Real (pre-inflation) interest on the principal, restated to year-end prices

5% on \$120 = \$6

The inflation-compensation of \$20, at the end of the year, is equal to the decline in the purchasing power of the principal - the \$100 principal at the beginning of the year should have appreciated by the end of the year to \$120 in order to maintain its purchasing power, but it remains \$100 because \$20 has been repaid by the nominal interest expenses.

In other words, during inflation, the nominal interest expense includes a fraction which is not a real interest expense but rather a part of the principal repayment - the inflation-compensation of principal. The inflation-compensation on the principal should be charged to the balance sheet, but following conventional accounting procedures, it is charged to the income statement. The above explains the unique behavior of interest expense during inflation.

In the case of an index-linked loan, both the real, pre-inflation interest on the restated loan (\$6) and the restatement differential (\$20) are recorded as interest expense in the income statement. But since the restatement differential of \$20 is not paid out, it is recorded as additional liability through the indexation of the loan (from \$100 to \$120).

The higher the inflation rate, the larger the fraction of the loan's principal repayment embodied in the nominal interest expense (pL). Suppose the inflation rate is 80% instead of 20% in the former example, then the interest expense is

$$rL = 0.80 \cdot 100 + 0.05[(1 + 0.80) \cdot 100] = 80 + 9 = \$89$$

compared to \$26 under 20% inflation, or \$5 with zero inflation.

It should be mentioned that in reality the prevailing nominal interest rates are not necessarily fully inflation-compensated as assumed above, and discussed below in Section 2.6

2.3 Illustration

The unique effect of interest expense on a company's financial statement during inflation is illustrated on a simplified example. Consider a firm with an investment of \$200 in land. The investment is financed by \$100 equity and \$100 "standing" loan, the principal of which is not repaid, carrying 5% interest per annum. The earnings before interest are \$20, paid at the end of the year. For simplifying the presentation, it is assumed that there are no inventories and depreciable assets and no investments, disinvestments and equity issues over the years. The \$15 net income (\$20 earnings less \$5 interest) is paid out as dividend at the end of the year, assuming income tax does not exist. These conditions can prevail perpetually.

Suppose now that inflation started, that is, during the year 19x2 the general price level increased by 20%. Accordingly, the nominal interest rate increased to 26%, as explained above. Suppose further that the year-end dividend is fully inflation-compensated; that is, the dividend is set at the pre-inflation amount plus 20% inflation-compensation.

The corresponding financial statements - for both 19x1, the pre-inflation year and 19x2, when inflation prevailed - are presented in Exhibit 1. The income statement and balance sheet for 19x1 represent a steady situation under a constant price condition. The cash flow in each year - 19x1 and 19x2 - is equal to the figures recorded in the income statement. The income statement for

19x2 shows that both the earnings before interest and dividend increased by 20% from 9x1 to 19x2, corresponding to the 20% inflation. But the interest expense increased by much more, since it includes \$20 inflation-compensation of the principal. As a result, there is a \$20 loss (after dividend) which is financed by an additional loan, as recorded in the conventional balance sheet for December 19x2. This loss, however, would be eliminated by restating the opening balance of land (which is stated in current cost) using a 1.2 restatement factor (Section 4.1). The equity in the restated balance sheet (\$120) is derived by subtracting the debt from the restated assets (240 - 120).

To complete the adjustment of the firm's illustrative financial statements, the adjusted net income must be derived. Two procedures for deriving the adjusted net income are presented in Exhibit 2. The corresponding procedures used in deriving the adjusted net income are discussed in Sections 3.5-3.7, except for the item "Gain on net monetary position" which is explained below.

2.4 Gain on Net Monetary Position

IAS 29 requires that the gain on net monetary position will be included in the adjusted net income (par. 26). Net monetary position is defined as liabilities less monetary assets. Since this amount is stated in nominal money units (see monetary items; Section 1.6), it is not restated whereas the other balance-sheet items (nonmonetary assets; Section 1.6) are restated. The meaning of the gain on net monetary position can best be explained by the following

diagram; representing the opening restated balance sheet.

A	Monetary assets	Debt	C
B	Nonmonetary assets	Equity	D

The net monetary position is indicated in the diagram by {B-D}

In the case of the illustrative firm, the opening balance sheet in current prices, is;

Land = \$200	Debt = \$100
	Equity = \$100

The net monetary position is $200 - 100 = \$100$

The gain on this item is \$20 as follows;

Given 20% inflation during the year, this balance sheet should be restated at the end of the year. The restatement gains are

Land, $\$200 \times 0.2$	40
Less: Equity, $\$100 \times 0.2$	<u>(20)</u>
Net restatement gain	20

The net restatement gain should be added to the net income while determining the adjusted net income, as recorded in exhibit 2.

Alternatively, the net monetary position represents the debt which finances the nonmonetary assets. Since the latter is restated but the former is not, there is a restatement gain, called gain on net monetary position. In the illustrative firm, the net monetary position, determined by the debt, is \$100 and the gain is

$$100 * 0.2 = \$20$$

The \$20 gain on net monetary position represents the decline in the real value of the debt during the year, which is already included in the nominal interest expense as inflation-compensation of the loan's principal. In other words, since the inflation-compensation on the principal, which is included in the interest expense, is charged to income, the restatement gain on this principal should be credited to income, as shown in Exhibit 2. This is the reason that according to IAS 29, it may be helpful if the interest expense is presented together with the gain on net monetary position (par. 26). This situation holds when the nonmonetary assets consist only of long-life assets.⁷

2.5 Deriving the Real Interest Rate

Section 2.1 shows how to determine the nominal interest rate during inflation, given the long-run, pre-inflation interest rate and the expected inflation rate. Here, the reverse is shown - how to determine the real, inflation-free interest rate, given the nominal prevailing interest rate and the actual inflation rate. Thus, the real, inflation-free interest rate is determined by

$$r' = \frac{1 + r}{1 + p} - 1$$

where r' = real, inflation-free interest rate,

r = prevailing nominal interest rate,

p = inflation rate, actual,

Suppose the nominal interest rate is 26% and the actual inflation rate was 20%, then the real interest rate is

$$r' = \frac{1 + 0.26}{1 + 0.20} - 1 = 0.05 = 5\%$$

2.6 The Suppressed Interest Rate Case

The discussion in the former sections assumes that the interest on loans includes a full inflation-compensation on the principal and that the actual inflation rate was equal to the expected rate used in determining the interest rate. In real life, however, discrepancies between the expected inflation rate and the actual rate usually exist. Furthermore, in many economies there are institutional regulations controlling the nominal interest rates, thereby often suppressing the nominal interest rates. Such a situation is illustrated below. Suppose the actual nominal interest rate was 15% and the inflation rate was 20%, then the real interest rate is

$$\frac{1 + 0.15}{1 + 0.20} - 1 = -0.0417 = -4.17\%$$

That is, the actual interest rate was set at such a level that did not even pay the full inflation-compensation on the principal. The borrower received \$100 at the beginning of the year and repaid \$115 at the end of the year, despite the fact that maintaining the purchasing power of the loan requires a repayment of \$120. The \$5 difference on the \$120 inflation-compensated sum is 4.17%.

3. ILLUSTRATION OF ADJUSTING FINANCIAL STATEMENTS

The purpose of this chapter is to provide a simplified illustration of the procedures required for inflation-adjustment of a company's conventional financial statements. In other words, given that the company did not apply IAS 29, or any other inflation-adjustment procedure, to restate its financial statements, the illustration should guide the analyst how to derive the restated (inflation-adjusted) information from the available figures, to arrive at adjusted statements that suit IAS 29's requirements.

The illustration provides an overview of the inflation-adjustment procedures. A simplified example serves for illustrating in a stepwise way, the application of the procedures required to arrive at inflation-adjusted financial statements, including derivation of the adjusted net income.

To simplify the presentation, only the main items of the financial statements are included in the example. Furthermore, the results of applying the cumbersome restatement procedures, especially those related to nonmonetary assets (inventories, investments, fixed assets), in the form of restated figures, are presented here. These results are based on the procedures for deriving the restated figures which are presented and illustrated in Chapter 4.

3.1 The Original Data

The conventional financial statements, which serve for illustration, are presented together with the restated statements in Exhibits 3 and 6.

Opening Balance Sheet - The conventional balance sheet of a company for December 31, 1988, is presented in the left column of Exhibit 3 (Opening balance sheet). The company holds five categories of assets acquired over the past years and recorded at historical cost; totaling \$480. The assets are financed mainly by liabilities (\$350) and partially by capital stock (\$50) issued in some given dates in the past, and retained earnings (\$80) accumulated over time.

Closing Balance Sheet - The conventional closing balance sheet for December 31, 1989 is also presented in Exhibit 3. During 1989 the company neither invested nor disposed of shares or fixed assets, also no equity additions or withdrawals occurred. Therefore, the recorded nominal value of the shares, land and capital stock did not change during the year. The recorded value of the depreciable assets declined only by the nominal depreciation of \$20. The retained earnings increased by \$50 as determined by the conventional income statement (Exhibit 6).

Income Statement - The conventional income statement for 1989 is presented in Exhibit 6. All the items in the statement are recorded at historical values - sales, purchases, expenses and interest incurred during the year, whereas the opening inventory value and depreciation represent cost incurred before 1989. The net income of \$50 is retained, given that the company does not pay income tax. The company distributed \$10 dividend by several payments during the year 1989.

3.2 Restating the Opening Balance Sheet

The individual items in the conventional opening balance sheet (December 31, 1988) should be restated to December 1988 prices. This is the main time-consuming step when detailed restatement is carried out; that is, when each asset is revalued.

Assets - The monetary assets (cash, receivables, investment in bonds, etc.), which are stated in nominal money units, do not require any restatement, because the nominal value represents the real value of the asset concerned. Therefore, the value of these items in the restated balance sheet equals the recorded value in the conventional statement (\$100 in Exhibit 3). In contrast, the nonmonetary assets - inventories, shares, depreciable assets, and land are restated. The restatement can be carried out in two ways:

- 1) Applying the corresponding restatement factor (Section 4.1) to each recorded transaction in these assets over the company's history, or
- 2) Using approximating factors, applied to groups of assets (not presented here because of space limitation).

The restatement process of the nonmonetary assets inflated the values of the four categories of assets from \$380 (80 + 50 + 200 + 50, respective historical values) to \$570 (100 + 70 + 300 + 100, respective restated values). That is, the historical costs of these assets, restated to December 1988 prices, is \$570 rather than \$380 as recorded in the conventional historical-cost balance sheet.

To comply with the accounting principle of "the lower of cost or market value", the market value of the main items was estimated not to be lower than the restated values.

Equities - The liabilities (payables, received loans, etc.), which are monetary items and stated in nominal money units, do not require any restatement as the nominal value represents the real value of the liability concerned (Section 1.6). Therefore, the restated value equals the recorded value in the conventional statement (\$350 in Exhibit 3). The capital stock, which has been issued in the past, is restated. The restatement is carried out by applying the corresponding restatement factor (Section 4.1) to each recorded capital stock transaction (equity addition) over the company's history. If these data are not available, the capital stock item should be added to the retained earnings. The retained earnings item is not restated; it is derived by subtracting the liabilities and capital stock from the total restated assets (Exhibit 3), that is,

$$670 - 350 - 200 = \$120$$

It should be noted that the liabilities compose 52% of the restated balance sheet (350/670), whereas the corresponding figure derived from the conventional balance sheet is distorted and accounted for as much as 73% (350/480).

3.3 Restating Intra-Year Capital Transactions

Intra-year capital transactions are those transactions incurred during the year which directly affect the level of balance-sheet items, such as investments or disinvestments in shares, fixed assets, and equity additions or withdrawals.

These transactions should be restated to year-end prices. The restatement of these items can be carried out in two ways:

- 1) Applying the corresponding restatement factor (Section 4.1) to each recorded transaction, or
- 2) Using the average price index (Section 4.5) for the restatement factor, assuming that the transactions incurred more-or-less evenly during the year.

Restating Dividend Payments - The treatment of dividend payments is similar in nature to that of capital transactions. This is because the dividend payment can be viewed similarly to withdrawal of equity. The restated dividend payments are not added to the restated financial statements but rather considered separately.

Illustration - To simplify the presentation, the illustrative example assumes no capital transaction. To illustrate the restatement procedure, nevertheless, it is assumed that the company distributed \$10 in several dividend payments during 1989. This sum is restated to December 1989 prices, using the average price index. The restatement factor is

$$\frac{\text{Price index Dec. 1989}}{\text{Average price index Dec. 1988 - Dec. 1989}} = 1.1$$

Thus, the restated dividend payments is

$$10 * 1.1 = \$11.$$

This sum should be added to the adjusted net income in computing the company's returns for 1989.

3.4 Restating the Closing Balance Sheet

The restated closing balance sheet is the result of adjusting data from three sources:

- 1) Monetary assets, inventories and liabilities - derived from the conventional closing balance sheet. These items are treated according to the procedures outlined in Section 3.2
- 2) Shares, depreciable assets, land, and capital stock - derived from the opening restated balance sheet. These items are updated to year-end prices (Section 4.3).
- 3) Intra-year transactions related to shares, depreciable assets, land and equity. These items are restated to year-end prices as outlined in the former section.

Monetary Assets and Inventories - Monetary assets are not restated, therefore their value in the restated balance sheet equals the recorded value in the conventional statement (\$110 in Exhibit 3). The restatement process inflated the value of the closing inventories from \$100 to \$110.

Nondepreciable Assets and Capital Stock - The restated values of shares, land and capital stock, as recorded in the opening restated balance sheet (December 31, 1988), are updated to December 1989 prices. Given that there were no transactions in these items during 1989 (and no decline in the market values below the restated values), and that the inflation rate was 20% during the year, the individual items are inflated by using a restatement factor of 1.2 (from \$70 shares, \$100 land, and \$200 capital stock, in December 1988 to \$84, \$120, and \$240, respectively, in December 1989).

Depreciable Assets - The treatment of depreciable assets, such as plant and equipment, involves the restatement of both assets value and depreciation expenses, to December 1989 prices. Given that there was neither investment nor disinvestment in these assets during 1989 and that the inflation rate was 20% during the year, the corresponding restated values are presented in Exhibit 4.

The restated opening acquisition cost of \$400 is updated to \$480 in December 1989 prices (restatement factor of 1.2). The \$32 depreciation for 1989 is derived from the restated acquisition cost, and stated in December 1989 prices.

3.5 Deriving the Year's Adjusted Net Income

The simplest way to derive the inflation-adjusted (current-cost) net income of a company is by measuring the change in equity between the closing and opening balance sheets, where the figures are stated in year-end prices. The adjusted paid-out dividends should be added to the adjusted net income to adequately evaluate the return on the company's assets and equity.

The adjusted net income for the illustrative company in 1989 is calculated in Exhibit 5. The value of equity is equal to the restated value of assets less liabilities; that is, \$320 in December 1988, \$442 in December 1989. When these values are stated in December 1989 prices, the value of equity increased, during 1989, by \$58. This sum represents the adjusted net income for 1989. In comparison, the net income, as reported by the conventional income statement, is only \$50 (Exhibit 6). Taking into account the adjusted paid-out dividends of \$11, stated in December 1989 prices, the total returns for the year are \$69

(50 + 11). Relating these returns to total opening restated assets of \$804 (in December 1989 prices) implies 8.6% return (69/804).

Advantage of the Procedure - The derivation of the adjusted net income from the restated balance sheets simplifies the computation of the adjusted net income. Moreover, this procedure avoids mistakes that often occur when the adjusted net income is derived directly from the adjusted income statement. This is because of the cumbersomeness of combining income-statement data with restated balance-sheet data as shown in the next two sections.

Alternative Procedures - There are two ways to adjust income statements:

- 1) Adjusting only balance-sheet-derived items (inventories and depreciation) and adding balance-sheet restatement gains, as presented in Section 3.6 below. (See Goldschmidt and Admon, 1977 and Goldschmidt et al 1986).
- 2) Restating all income-statement items and adding restatement gains from both balance sheet and income statement, as presented in Section 3.7 below. (See Stickler and Hutchins, 1975 and accounting standard committee 1986)

3.6 Adjusting the Income Statement

The conventional income statement for a given year includes some items that are recorded at cost incurred in former years, such as inventories and depreciation. One way to derive an adjusted income statement is to restate these items and to add the balance-sheet restatement gain (loss), as illustrated below. This procedure is relatively simple to apply but the adjusted figures are stated in year-end prices whereas the other income-statement items are

stated in year-average prices, a situation that creates some problems when the individual items in the adjusted income statement are used for planning and control.

The conventional income statement for 1989 and the adjusted statement following the above mentioned procedures are presented in Exhibit 6. As can be seen, only the inventories and depreciation are adjusted (figures are taken from Exhibits 3 and 5). Derivation of the restatement gains deserves some explanation.

Balance-Sheet Restatement Gains - Recall, four items of the closing balance sheet (for December 31, 1989) are derived from the opening balance sheet (for December 31, 1988): shares, depreciable assets, land and equity. These are long-life nonmonetary assets and equity. Monetary assets, inventories and liabilities, on the other hand, are derived from the closing balance sheet (Section 3.4).

The opening restated balance sheet for December 31, 1988 is depicted in Exhibit 7. As can be seen, the \$470 long-life nonmonetary assets are financed by \$320 equity. As both items are restated to December 1989 prices, but the value of the non monetary assets exceeds that of equity, there are restatement gains.⁸ The derivation of these gains is presented in the footnote of Exhibit 6 and in Exhibit 8. The net restatement gains of \$30 are added to the net income to arrive at the adjusted net income of \$58 (Exhibit 6).

3.7 Restating All Income-Statement Items

Adjustment of the conventional income statement can be carried out by restating all the items to year-end prices. This procedure provides improved

information for planning and control purposes, but it is more cumbersome to apply and difficult to comprehend.

The conventional income statement for 1989 and the adjusted statement, following the above mentioned procedure, are presented in Exhibit 9. As can be seen, all the items are adjusted to December 1989 prices by applying the corresponding restatement factor to each item. The derivation of the gain on net monetary position deserves some explanations.

Gain on Net Monetary Position - The derivation of this gain is more complicated than the derivation of the net restatement gains, as explained in the former section. This is because all the income statement items are restated and thus, the restatement gains on both balance-sheet items and income-statement items must be calculated. The source of the gain lies in the excess of liabilities over monetary assets which are not revalued (see Section 2.4). The derivation of this gain is presented in Exhibit 10. The gain of \$40 is added to the net income to arrive at the adjusted net income of \$58 (Exhibit 9).

Overcoming the Cumbersomeness - The fully restated income statement, as presented in Exhibit 9, provides figures that are stated in year-end prices. Thus, these figures can be used directly for planning and control purposes, as required by IAS 29 (par. 25). However, besides this advantage, the derivation of the figures, especially deriving the gain on net monetary position, is cumbersome and difficult to comprehend. To overcome this limitation and to arrive at the figures suitable for planning and control, it is possible to carry out only two simple computations:

- 1) Deriving the adjusted net income from the restated balance sheets (as explained in Section 3.5), and
- 2) Restating the individual income-statement items to year-end prices.

3.8 Updating Time-Series Restated Figures

The restatement process of financial data pertains to the price level of the year under analysis. The balance-sheet items are restated to year-end prices; most of the income-statement items are recorded in year-average prices (Exhibit 6), or restated to year-end prices (Exhibit 9). In order to enable inter-year comparison of the figures, these should be updated (Section 4.3) to the price level at the last date of the series of figures. This procedure is illustrated below.

Time-series comparison of the restated 1988's and 1989's balance sheets for the illustrative company is presented in Exhibit 11. As can be seen, the real value of four categories of assets decreased from December 31, 1988 to December 31, 1989. Thus, the total real value of the assets decreased by 6% (from \$804 to \$752, in December 1989 prices), whereas the real value of the equity increased by 40% and the level of the liabilities decreased by 26%.

4. TOOLS FOR RESTATING FINANCIAL DATA

In order to make the financial statements meaningful during a period of inflation the figures, which are recorded at historical costs (incurred at the recording date), must be restated, using an appropriate price index. The purpose of this chapter is to present the main tools required for these restatements.

IAS 29 requires using a general price index that reflects changes in the general purchasing power (par. 35). In most countries the Consumer Price Index is the appropriate index. In the case that price index is not available for the periods for which the restatement of fixed assets is required, an estimate base should be used, such as the movements in the exchange rate between the reporting currency and a relative stable foreign currency (IAS, par. 15).

4.1 Restatement Factor

Restatement factor is used to inflate a given value in proportion to the inflation that has occurred since the recording date.

$$\text{Restatement factor} = \frac{\text{Price index at end of analyzed period}}{\text{Price index at recording date}}$$

This factor is used for two types of inflation-adjustments:

- 1) Restating historical financial figures to current price level, for analyzing a given year's financial data, and
- 2) Updating restated financial figures for inter-year comparison of financial data.

4.2 Restating Historical Figures

To arrive at a meaningful year-end financial figures, the recorded figures should be restated. Restatement means translating figures from historical dollars, recorded at a given date, to dollars of purchasing power at a later date, using a restatement factor.

Example: A company invested \$100 in June 1985 and \$200 in July 1988.

The restated value of these investments for December 1989 is \$568:

	<u>June 1985</u>	<u>July 1988</u>	<u>Dec. 1989</u>	<u>Total</u>
Price index	130	210	330	
Restatement factor	330 --- = 2.54 130	330 --- = 1.57 210	330 --- = 1.00 330	
Recorded cost	\$100	\$200		\$300
Restated cost	254	314		568

4.3 Updating Restated Figures

To enable inter-year comparisons of restated financial figures, these figures must be updated to the last date for which the analysis is carried out. Updating means translating figures from restated dollars for a given date in the past to dollars of purchasing power at a later date, using a restatement factor. Example: Adjusted financial figures for December 31, 1988 and December 31, 1989 are compared, as follows:

	<u>Dec, 31, 1988</u>	<u>Dec. 31, 1989</u>	<u>Growth</u> <u>Absolute Relative</u>	
Price index	220	330		
Restatement factor	330 --- = 1.50 220	330 --- = 1.00 330		
Restated figures for every year:				
Assets	\$1000	\$1650		
Net income	110	140		
Updated figures:				
Assets	\$1500	\$1650	\$150	1.10
Net income	165	140	-25	0.85

4.4 Average Price Index

An average price index for a given period should be used for restating values that are incurred evenly throughout the period.

$$\text{Average price index} = \frac{\text{Sum of } t \text{ indexes for } n \text{ periods}}{t}$$

where $t = n + 1$, which is the number of indexes from beginning to end of n periods.

Thus, the average price index for the year 1989 is

$$\frac{\text{Sum of Dec. 1988 to Dec. 1989 indexes}}{13}$$

Example: Consider the following price indexes

Oct. 1989 - 307; Nov. 1989 - 320; Dec. 1989 - 330

The average price index is

$$\frac{307 + 320 + 330}{3} = 319$$

The corresponding restatement factor is $330/319 = 1.0345$

4.5 Restating Intra-Year Flows

Intra-year flows imply financial transactions that take place over consecutive months such as sales and purchases. For accurate results, every monthly transactions should be restated to the year-end currency. However, when

detailed data are not available or when the flow (in real terms) is uniform over the analyzed period, the total flow can be restated using the average price index.

Example: The sales during 1989 amounted to \$2000. The average price index for the period December 1988 - December 1989 was 300 and the price index for December 1989 was 330. Thus, the restatement factor is

$$330/300 = 1.1$$

and the restated sales value in December 1989 prices, is

$$2000 * 1.1 = \$2200$$

4.6 Holding Time of Inventories

Deriving the average holding time of a stock of inventory (that is, the average age of the stock of inventory, often called turnover time) is required when the analyst intends to restate the overall value of the stock, rather than to restate the individual transactions. Approximating rules are presented below for two types of inventories:

- 1) Raw materials, and
- 2) Goods in process and finished goods.

The rules are applicable when the FIFO or the Average accounting methods are used.⁹

Holding Time of Raw Materials - The average time an inventory of raw materials is held in storage (turnover time), under the FIFO and Average methods, expressed in months, is approximated by

$$\frac{\text{Average value of inventory}}{\text{Cost of materials used}} * 12$$

where the average value of inventory is;

$$\frac{\text{Value of opening + closing inventories}}{2}$$

Example: The financial statements of a company, where the FIFO method is used, record \$95 and \$105 of materials inventory in the opening and closing balance sheets, respectively; and \$400 cost of materials used. The average time that the stock is held in storage is approximately

$$\frac{(95 + 105)/2}{400} * 12 = 3 \text{ months}$$

Holding Time of Work in Process and Finished Goods - The average time an inventory of work in process and finished goods is held in storage, expressed in months, is approximated by

$$\frac{\text{Average value of inventory}}{\text{Cost of goods sold}} * 12$$

Example: The financial statements of a company, where the FIFO method is used, record \$800 cost of goods sold and

	<u>Opening B.S.</u>	<u>Closing B.S.</u>	<u>Average</u>
Goods in process	\$120	\$120	\$120
Finished goods	80	100	90

